What is claimed is:

1. A multiband receiving apparatus, comprising:

a phase locked loop for receiving a reference frequency signal and a signal output from a voltage controlled oscillator and for generating a control voltage for controlling the frequency of the signal output from the voltage controlled oscillator;

a low noise amplifier for receiving the control voltage, for operating at a frequency band that is adjusted by the control voltage, and for amplifying a received signal while suppressing a noise signal in the received signal; and

a down mixer, including a plurality of transistors, for receiving the control voltage, for controlling an input voltage applied to the gate of a transistor acting as a source among the transistors, for operating at a frequency band that is adjusted by the control voltage, and for converting the amplified signal into a low-frequency band signal.

2. The multiband receiving apparatus as claimed in claim 1, wherein the low noise amplifier comprises:

an LC resonance circuit having an inductor and a capacitor, wherein a capacitance of the capacitor is adjusted by the control voltage provided by the phase locked loop to change a resonance frequency of the LC resonance circuit.

3. The multiband receiving apparatus as claimed in claim 1, wherein the low noise amplifier has a cascade structure capable of minimizing a noise property and comprises:

an inductive source degenerator for performing impedance matching.

4. The multiband receiving apparatus as claimed in claim 1, wherein the down mixer has a Gilbert-type structure.

5. The multiband receiving apparatus as claimed in claim 1, wherein the down mixer comprises a plurality of transistors, and wherein at least one of the plurality of transistors operates as a current source and at least one of the plurality of transistors operates as a load, and the down mixer controls an amount of current flowing from the transistor operating as the source to the transistor operating as the load using the control voltage from the phase locked loop, thereby adjusting an operating frequency band of the multiband receiving apparatus.

6. A multiband transmitting apparatus, comprising:

a phase locked loop for receiving a reference frequency signal and a signal output from a voltage controlled oscillator and for generating a control voltage for controlling the frequency of the signal output from the voltage controlled oscillator;

an up mixer, including a plurality of transistors, for receiving the control voltage, for controlling an input voltage applied to a gate of one of the

plurality of transistors that operates as a source, for operating at a frequency band, and for converting a transmitting signal into a high-frequency band of signal; and

a power amplifier for receiving the control voltage, for operating with a gain that is adjusted by the control voltage, and for amplifying the converted signal by the adjusted gain.

7. The multiband transmitting apparatus as claimed in claim 6, wherein the up mixer has a Gilbert-type structure.

8. The multiband transmitting apparatus as claimed in claim 6, wherein the up mixer comprises a plurality of transistors, and wherein at least one of the plurality of transistors operates as a current source and at least one of the plurality of transistors operates as a load, and the up mixer controls an amount of current flowing from the transistor operating as the

source to the transistor operating as the load using the control voltage from the phase locked loop to adjust an operating frequency band.

9. The multiband transmitting apparatus as claimed in claim 6, wherein the power amplifier has a cascade structure including a plurality of terminals and comprises:

an LC resonance circuit having an inductor and a capacitor, wherein a capacitance of the capacitor is adjusted using the control voltage provided by the phase locked loop to change a resonance frequency of the LC resonance circuit, to adjust a gain of the power amplifier.

10. A multiband transmitting and receiving apparatus, comprising:

a phase locked loop for receiving a reference frequency signal and a signal output from a voltage controlled oscillator and for generating a control voltage for controlling a frequency of the signal output from the voltage controlled oscillator;

a low noise amplifier for receiving the control voltage, for operating at a frequency band that is adjusted by the control voltage, and for amplifying a received signal without amplifying a noise signal in the receiving signal;

a down mixer, including a plurality of transistors, for receiving the control voltage, for controlling an input voltage applied to the gate of one of the plurality of transistors acting as a source, for operating at a frequency band that is adjusted by the control voltage, and for converting the amplified signal into a low-frequency band signal;

an up mixer, including a plurality of transistors, for receiving the control voltage, for controlling an input voltage applied to the gate of one of the plurality of transistors acting as a source, for operating at a frequency band that is adjusted by the control voltage, and for converting a transmitting signal into a high-frequency band signal; and

a power amplifier, which receives the control voltage, for operating with a gain that is adjusted by the control voltage and for amplifying the converted signal by the adjusted gain.

11. A low noise amplifier used in an RF transceiver, comprising:

a phase locked loop for receiving a reference frequency signal and a signal output from a voltage controlled oscillator and for generating a control voltage for controlling the frequency of the signal output from the voltage controlled oscillator; and

an LC resonance circuit including an inductor and a capacitor,

wherein a capacitance of the capacitor is adjusted using the control voltage provided by the phase locked loop to thereby change a resonance frequency of the LC resonance circuit.

12. A power amplifier used in an RF transceiver, comprising:

a phase locked loop for receiving a reference frequency signal and a signal output from a voltage controlled oscillator and for generating a control voltage for controlling the frequency of the signal output from the voltage controlled oscillator; and

an LC resonance circuit having a cascade structure having a plurality of terminals and including an inductor and a capacitor,

wherein a capacitance of the capacitor is adjusted using the control voltage provided by the phase locked loop to thereby change a resonance frequency of the LC resonance circuit and adjust the gain of the power amplifier.

13. A mixer used in an RF transceiver, comprising:

a phase locked loop for receiving a reference frequency signal and a signal output from a voltage controlled oscillator and for generating a control signal for controlling the frequency of the signal output from the voltage controlled oscillator; and

a plurality of transistors,

wherein at least one of the plurality of transistors operates as a current source, at least one of the plurality of transistors operates as a load, and an amount of current flowing from the transistor operating as the source

to the transistor operating as the load is controlled using the control voltage from the phase locked loop.

14. A data receiving method, which is implemented on multiple frequency bands, comprising:

(a) receiving a signal;

(b) receiving a reference frequency signal and a signal output from a voltage controlled oscillator and controlling a control voltage that controls a frequency of the signal output from the voltage controlled oscillator;

(c) receiving the control voltage, adjusting an operating frequency band, operating at the adjusted frequency band, and amplifying a received signal while suppressing a noise signal in the received signal; and

(d) receiving the control voltage, controlling an input voltage applied to a gate of a transistor operating as a source using the control voltage to adjust an operating frequency band, operating at the adjusted frequency band, and converting the amplified signal into a low-frequency band signal.

15. The data receiving method as claimed in claim 14, wherein in a low noise amplifier including an LC resonance circuit including an inductor and a capacitor, (c) comprises:

adjusting a capacitance value of the capacitor using the control voltage; and

changing a resonance frequency of the LC resonance circuit to adjust the operating frequency band of the low noise amplifier.

16. The data receiving method as claimed in claim 14, wherein in a down mixer including a plurality of transistors, wherein at least one of the plurality of transistors operates as a current source and at least one of the plurality of transistors operates as a load, (d) comprises:

controlling an amount of current flowing from the transistor operating as the source to the transistor operating as the load, using the control voltage, to adjust an operating frequency band of the down mixer.

17. A data transmitting method, which is implemented on multiple frequency bands, comprising:

(a) receiving a signal;

(b) receiving a reference frequency signal and a signal output from a voltage controlled oscillator and generates a control voltage that controls a frequency of the signal output from the voltage controlled oscillator;

(c) receiving the control voltage, controlling an input voltage applied to a gate of a transistor operating as a source using the control voltage to adjust an operating frequency band, operating at the adjusted frequency band, and converting the received signal into a high-frequency band signal; and

(d) receiving the control voltage to adjust the gain and amplifying the converted signal by the adjusted gain.

18. The data transmitting method as claimed in claim 17, wherein in an up mixer including a plurality of transistors, wherein at least one of the plurality of transistors operates as a current source and at least one of the plurality of transistors operates as a load, (c) comprises:

controlling an amount of current flowing from the transistor operating as the source to the transistor operating as the load, using the control voltage, to adjust an operating frequency band.

19. The data transmitting method as claimed in claim 17, wherein in a power amplifier having a cascade structure including a plurality of terminals, and including an LC resonance circuit having an inductor and a capacitor, (d) comprises:

controlling a capacitance of the capacitor using the control voltage and changing a resonance frequency of the LC resonance circuit to control a gain of the power amplifier.